

AMENDMENTS TO THE CLAIMS

Please amend the present application as follows:

Claims

1. (Previously presented) A light-emitting device, comprising:
a semiconductor light-emitting die;
a gradient index (GRIN) element having a cylindrical refractive index profile in which the refractive index varies radially and is substantially constant axially, the GRIN element comprising a first end surface opposite a second end surface and further comprising a cylindrical body having a first diameter, the cylindrical body characterized by a length-to-pitch ratio, the GRIN element arranged with the first end surface adjacent the light-emitting die to receive light therefrom and emitting the light from the second end surface in a radiation pattern dependent on the length-to-pitch ratio;
a header comprising a cavity extending thereinto, the cavity having a second diameter slightly smaller than the first diameter, the light-emitting die mounted in the cavity defined by the header; and
a push fit hermetic seal defined by an assembly comprising the GRIN element engaged in the cavity.
2. (Original) The light-emitting device of claim 1, in which:
the length-to-pitch ratio is equal to one fourth; and
the GRIN element emits the light in a collimated beam.
3. (Previously presented) The light-emitting device of claim 1, in which:
the length-to-pitch ratio is less than one fourth; and
the GRIN element emits the light in a diverging beam.
4. (Currently amended) The light-emitting device of claim 1, in which:
the length-to-pitch ratio is between ~~than~~ one fourth and one half; and
the GRIN element emits the light in a converging beam.
5. (Previously presented) The light-emitting device of claim 1, in which:
the length-to-pitch ratio is equal to one half; and
the GRIN element emits the light from a point source.

6-10. (Canceled)

11. (Previously presented) The light-emitting device of claim 1, additionally comprising index matching material located in the cavity.

12. (Canceled)

13. (Previously presented) A method of making a light emitting device, the method comprising:

- providing a semiconductor light-emitting die;

- providing a GRIN element having a cylindrical refractive index profile in which the refractive index varies radially and is substantially constant axially, the GRIN element comprising a first end surface opposite a second end surface and further comprising a cylindrical body having a first diameter, the cylindrical body characterized by a length-to-pitch ratio;

- arranging the GRIN element with the first end surface thereof adjacent the light-emitting die to receive light therefrom, the GRIN element emitting the light from the second end surface in a radiation pattern that depends on the length-to-pitch ratio;

- providing a header comprising a cavity extending thereinto, the cavity having a second diameter slightly smaller than the first diameter, the light-emitting die mounted in the cavity defined by the header; and

- providing a push fit hermetic seal defined by an assembly comprising the GRIN element and the cavity, the push fit hermetic seal being formed by engaging the GRIN element with the cavity.

14. (Previously presented) The method of claim 13, in which:

- providing a GRIN element comprises:

- providing GRIN elements each having a cylindrical refractive index profile, comprising a first end surface opposite a second end surface, and characterized by respective length-to-pitch ratio, the length-to-pitch ratios differing among the GRIN elements, and

- selecting one of the GRIN elements as a selected GRIN element, the selected GRIN element having a length-to-pitch ratio corresponding to a desired radiation

pattern; and
in the arranging, the selected GRIN element is arranged with the first end surface thereof adjacent the light source.

15. (Previously presented) The method of claim 13, in which providing a GRIN element comprises:

providing an elongate rod having a cylindrical refractive index profile characterized by a pitch; and
dividing off from the rod a lengthwise portion to provide the GRIN element.

16. (Previously presented) The method of claim 15, additionally comprising dividing the rod lengthwise into portions, ones of the portions having different lengths to provide the GRIN elements of light-emitting devices having different radiation patterns.

17. (Previously presented) The method of claim 13, additionally comprising:
providing an additional GRIN element having a cylindrical refractive index profile, comprising a first end surface opposite a second end surface and characterized by a length-to-pitch ratio different from the length-to-pitch ratio of the GRIN element; and
substituting the additional GRIN element for the GRIN element to change the radiation pattern of the light-emitting device.

18 – 22 (Canceled)

23. (Previously presented) The light-emitting device of claim 1, in which the second diameter is smaller than the first diameter in a range of 30-40 μm .

24 - 25. (Canceled)